

**AMENDMENTS TO THE DRAWINGS**

Substitute or Replacement sheets of drawings, containing Sheets 6 and 7, which contain original Figures 6 and 7, respectively, are presented to show the subject matter of Figures 6 and 7 with clean black lines, responsive to the Examiner's requirement.

Attachments: Substitute Sheets

### **REMARKS**

Applicants thank the Examiner for the thorough consideration given the present application. Claims 1-8 and 10-24 are now present in the application. Claims 1 and 22-24 are independent.

The Office Action dated February 6, 2008 has been received and carefully considered. Each issue raised in the Office Action is addressed below, and reconsideration and allowance of the pending claims are respectfully requested in view of the amendments and the following remarks.

#### **Priority Under 35 U.S.C. § 119**

Applicants thank the Examiner for acknowledging Applicants' claim for foreign priority under 35 U.S.C. § 119, and receipt of the certified priority document.

#### **Drawing Objection**

Responsive to the objection of the Examiner, corrected drawing sheets 6 and 7, that contain Figures 6 and 7, respectively, have been prepared and are attached hereto. Accordingly, reconsideration and withdrawal of the objection are respectfully requested.

#### **Allowable Claim Subject Matter**

Applicants appreciate the Examiner's indication that dependent claims 4, 15, 16 and 19 were objected to as containing allowable subject matter. Responsive thereto, new independent claims 22, 23 and 24, corresponding to original claims 4, 15 and 16, respectively, have been presented. It is submitted that claims 22-24 are automatically allowable by virtue of the prior objection of the Examiner. Accordingly, reconsideration and allowance of claims 22-24 is respectfully requested.

#### **Claim Rejection – 35 U.S.C. § 102**

In the Office Action, claims 1-3, 5-14, 17, 18 and 20 stand rejected under 35 U.S.C. § 102(b) as allegedly anticipated by U.S. Patent No. 6,431,790 to Anderegg et al. ("Anderegg").

Applicants submit that the Examiner has failed to establish a *prima facie* case of anticipation and respectfully traverse the rejection. A complete discussion of the Examiner's rejection is set forth in the Office Action, and is not being repeated here.

In order to establish a *prima facie* case of anticipation under 35 U.S.C. § 102, the cited reference must teach or inherently include each and every element of the claims. See *M.P.E.P.* § 2131; *M.P.E.P.* § 706.02. With regard to the rejection of claim 1, while not conceding the appropriateness of the Examiner's rejection, but merely to advance prosecution of the instant application, Applicants respectfully submit that independent claim 1 has been amended to include limitations of claims 2 and 3, to emphasize features of the first time-variable excitation force and determination of third data items. Claim 1 now requires that the first time-variable excitation force is produced as a periodic first force with a maximum first oscillation level, which is directed at right angles against the soil surface, and the third data items of a second oscillation response of the oscillation response of the oscillation of the vibration unit, caused by the second excitation force, are determined as a lowest subharmonic frequency.

Anderegg relates to a system having a compaction apparatus that forms an oscillating system together with the soil, whereas the apparatus and the soil have close contact at all times. Lifting off of the apparatus from the soil is described in Anderegg at column 3, lines 49-58, and column 7, lines 28-45. In contrast to the present invention, determination of the soil stiffness is evaluated exclusively based upon harmonics of the oscillations. Whereas, in Anderegg, while it is noted that subharmonics are present, the properties of the subharmonics are not used. Formula (6) of Anderegg states that:

$$C_B = \frac{F(\text{at } a=0)}{[1 - \cos(\pi^2/2K)] \cdot a}$$

This formula relates to measuring the soil stiffness at the moment where the lifting off of the apparatus occurs. The subharmonics may be employed for determining the state of lifting off or optimum compaction (see column 5, lines 44-50), however the subharmonics themselves or their amplitudes are not further taken into account. Therefore, in contrast to Anderegg, the invention involves the determination of third data items representing a lowest subharmonic frequency, and employing the third data for determining relative soil stiffness levels. Furthermore, Anderegg does

not disclose that a vibration plate is employed for determining soil stiffness levels. Accordingly, it is submitted that the applied prior art neither shows nor suggests the features of claims 1 and 8 as now amended, and is therefore patentable over the prior art, and dependent claims 2-7 and 10-21 are also allowable based upon their dependence on claim 1.

In summary, new independent claims 22-24 correspond to original claims 4, 15 and 16 written in independent form, and are deemed to be patentable, *inter alia*, based upon the indication of the Examiner. As discussed in detail above, Anderegg neither shows nor suggests the features of claims 1 and 8. None of the prior art relates to the use of the properties of subharmonics for determining soil stiffness levels, and accordingly there is nothing available in the prior art to suggest the use of these properties as now recited, *inter alia*, in claim 1. Furthermore, none of the prior art relates to the use of vibration plates for determining soil stiffness levels, and therefore there is nothing available in the prior art to suggest the use of such structure as now recited, *inter alia*, in claims 1 and 8. Since claims 2-7 and 10-21 ultimately depend from claims 1 and 8, respectively, they are likewise allowable at least for the reasons noted above.

### **Conclusion**

All objections and rejections raised in the Office Action having been properly traversed and addressed, it is respectfully submitted that the present application is in condition for allowance. Applicants therefore respectfully request that the Examiner reconsider all presently outstanding rejections and that they be withdrawn. It is believed that a full and complete response has been made to the outstanding Office Action, and as such, the present application is in condition for allowance. Notice of same is earnestly solicited.

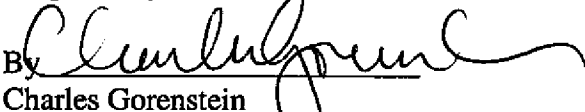
Prompt and favorable consideration of this Amendment is respectfully requested.

If the Examiner believes, for any reason, that personal communication will expedite prosecution of this application, the Examiner is invited to telephone Paul T. Sewell, Registration No. 61,784, at (703) 205-8000, in the Washington, D.C. area.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.14; particularly, extension of time fees.

Dated: May 6, 2008

Respectfully submitted

By 

Charles Gorenstein

Registration No.: 29,271

BIRCH, STEWART, KOLASCH & BIRCH, LLP

8110 Gatehouse Road

Suite 100 East

P.O. Box 747

Falls Church, Virginia 22040-0747

(703) 205-8000

Attorney for Applicant

Attachments: Figs. 6 and 7